

Final Design of the ITER Bolometer First Plasma Component: Cable Installation Template

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The ITER Bolometer cable installation template is a first plasma component which main function is to provide a temporary fixation of the mineral insulated cables and to protect them through first plasma operation inside the vacuum vessel until the final bolometer cameras are installed in the second assembly phase. In this paper, the final design of the cable installation template will be presented, the assembly procedures and important functional design details in order to be compliant with its interfaces, the vacuum vessel, the flux loops, the electrical services, the first plasma components and the assembly. Requirements that drive the design will be explained, along with the technical solutions chosen to fulfill them. Two important sub-components presented in more detail are the boss fixation, which will compensate geometrical uncertainties of the as-built boss positioning, as well as the mineral insulated cable holder, which will prepare the electrical termination and facilitate the installation of final vacuum vessel cameras during second assembly phase of ITER. Additionally, the step-by-step assembly plan agreed with the team of ITER machine assembly and tooling will be described. The system load specifications applicable for this first plasma component will be presented as well and an overview of the structural integrity analysis report will be given. Design measures taken to minimize the structural loads will be explained. It will be shown that most loads on the component are very limited and there is no risk of structural failure or loss of relevant system functions. The paper concludes with a summary of the work done to optimize the cable installation template regarding cost and manufacturability.

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